BOOK REVIEW

Tatyana A. Lobova, Cullen K. Geiselman, and Scott A. Mori. 2009. **Seed Dispersal by Bats in the Neotropics.** (ISBN 978-089327-501-3, hbk.). Memoirs of The New York Botanical Garden, vol. 101. The New York Botanical Garden Press, 200th Street and Kazimiroff Boulevard, Bronx, New York 10458-5126, U.S.A. (**Orders:** www.nybgpress.org, nybgpress@nybg.org, 1-718-817-8721, 1-718-817-8842 fax). \$70.00, 492 pp., 24 b&w illustrations + 32 color plates with more than 200 photographs, 7" × 10".

A beautiful cover illustration by Michael Rothman of the greater spear-nosed bat (*Phyllostomus hastatus*) flying away from a fruit of sapucaia (*Lecythis pisonis*) with a seed is how we are introduced to this monographic text that treats both the zoological and botanical aspects of bat-mediated seed dispersal (although with a slightly more botanical weight). This text represents a five-year intensive study that includes a thorough and well-cited literature survey of the topic, as well as a detailed account of field work and the results of the analyses that follow. It would be a delightful introduction for any student interested in animal-plant interactions, as well as an important addition to the library of any researcher concerning himself either with any of the 549 plant species mentioned or with bat biology.

There are five main sections, consisting of an introduction, conclusion, materials and methods, and the two largest sections: **Frugivorous bats** and **Plants dispersed by bats**. The former is divided into discussions of obligate and opportunistic frugivores, and provides a thorough discussion of each frugivorous bat species (organized by subfamily), including notes on "Diet Specificity, Seasonality, and Selectivity", "Foraging Strategy", and "Results for French Guiana". The **Plants dispersed by bats** section contains detailed plant treatments (sorted by family) divided into "Bat Dispersed Species in CFG[Central French Guiana]" and "Possible Bat Dispersed Species in CFG"; both these contain fruit descriptions, while the former also includes specific reference to the bat species that disperses it.

The appendices provide easy-to-use references if one should choose to further investigate either the bats dispersing plants (Appendix III) or the plants dispersed by bats (Appendix II). Appendix II also contains references to literature that is fully cited across 28 pages in the Literature Cited section. There is a 9-page glossary that assists the reader with the botanical and dispersal terminology referred to throughout the text. Appendix I details the diaspore collection vouchers yet unfortunately does not mention where these collections are housed.

The introduction does an excellent job of surveying the existing literature on the topic of bat dispersal, with easy to interpret tables and a clear message of the importance of a monographic publication of this sort. In the materials and methods section, we find that the study is supported by the long time botanical work at the study site of co-author Scott Mori, among others. There are beautifully presented color plates containing photographs of infructescences, fruits, and seeds of many of the families described in the text, which will likely be of particular aid in identification. The authors include both native and cultivated plant species in their survey, indicating this status in the descriptions. They make note of the discrepancies in comparing the literature, when different terminologies were used, plants were misidentified, or different taxonomic concepts were applied. Perhaps the most interesting portion of the book is found in the analysis of the characters of bat-dispersed plants (p. 103). Here the results of the study are summarized and analyzed with various statistics.

The authors analyzed fleshy fruited species that were determined suitable for animal consumption, and included the following characters for analysis: plant life form and habit, successional status, fruit type, infructescence position, fruit aggregation and position, plant part bats feed on, color of the edible part, part digested, diaspore, diaspore size, and bat dispersal type. Other characters that were discussed, but not statistically treated included fruit aroma, maturation time and nutritional content.

The authors summarize their results by the characters analyzed, and while some of their results support existing lines of thinking, there are a few results that surprise and shed light on new directions requiring further exploration (a particularly useful thing for students seeking projects in this field). The results are compared to those found at other study sites in the neotropics, although the only study with which they could provide any useful comparisons (after modifying the organization of their data) were those completed at Barro Colorado Island in Panama.

The authors identify the six top families (in terms of number of species) most sought after by bats in the neotropics as the Piperaceae (Pepper Family), Araceae (Philodendron Family), Cyclanthaceae (Panama Hat Family), Solanaceae (Potato Family), Moraceae (Mulberry Family), and Clusiaceae (Mangosteen Family). It is suggested that observed differences across study sites in the relative importance of these families has to do with forest structure and plant and bat communities. They generalize the plant characters preferred by bats to include those plants that are members of the largest plant families, have wide distributions, produce fruit in abundance throughout the year, are primarily dispersed by bats, have fruit that are soft and defense-less with multiple seeds or have numerous single fruits with single seeds, and that have small seeds that are easy to swallow and pass.

This book is quite logical in its layout and thus easy to use as the reference it is, but the conclusions the study reaches elucidate many more areas for further study and critical thought, as any good scientific project ought. It is an easy marriage of botany and zoology, and speaking from a botanical perspective, much more than satisfactory and a necessary reference for anyone studying plant-animal interactions.—Tiana Franklin, Botanical Research Institute of Texas, Fort Worth, Texas 76102-4025, U.S.A.